

## *Prostanthera* (Lamiaceae) from far-north Queensland, Australia

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### Abstract

The most northerly species of *Prostanthera* (Lamiaceae) occur in the Cook botanical district of far-northern Queensland. These include *P. albohirta* and *P. clotteniana*, as well as the three new species described here, *P. athertoniana*, *P. mulliganensis* and *P. tozerana*. Since all species are inadequately known, an identification key to these species and descriptions are provided, as well as illustrations of the three new species.

### Introduction

The endemic genus *Prostanthera* Labill. (Lamiaceae) occurs throughout much of Australia, with approximately 32 formally described species occurring in Queensland and approximately 14 additional species that are currently only referred to by informal phrase names. Although the genus occurs throughout much of Queensland, it tends to be more common in the southern and eastern parts of the State. Since fewer species, particularly those of *P.* section *Prostanthera*, occur in the area between Townsville and Rockhampton, in the North Kennedy, South Kennedy, Leichhardt, and Port Curtis botanical districts – Anonymous (1975), this has been used as the rationale for treating the northern species of the genus separate from the other more southern Queensland species. Each of the new species has a restricted distribution, *P. athertoniana* is known from Kahlpahlim Rock (Lamb Range), *P. mulliganensis* from Mount Mulligan (north of Dimbulah), and *P. tozerana* is only known from Mount Tozer (Kutini-Payamu National Park). The two other species also have very restricted distributions, *P. clotteniana* occurring in the Herberton-Ravenshoe-Atherton area and *P. albohirta* only known from Mt Demi and the Mt Emerald area. All species treated here are confined to the Great Dividing Range (in the vicinity of Ravenshoe-Atherton area, south-west of Cairns), at Mt Mulligan, and north to Mt Tozer (Cape York Peninsula), occurring in the Cook botanical district (sensu Anonymous 1975). Furthermore, these species are only known from relatively few botanical collections.

### Key to species

- 1a. Leaves with margin lobed (tooth-like); calyx not enlarging in fruit ..... 2
- 1b. Leaves with margin entire; calyx enlarging in fruit ..... 3
- 2a. Leaves with margin 1-toothed on each side; lamina obovate, sometimes elliptic or oblong  
..... *P. athertoniana*
- 2b. Leaves with margin 2- or 3- (rarely 4) toothed (serrate) on each side; lamina ovate ..... *P. albohirta*
- 3a. Prophylls 0.3–0.5 mm wide [length to width ratio 8.3–13.8] (branchlets moderately hairy [40–50 hairs/mm<sup>2</sup>] and lamina length to width ratio 3–5) ..... *P. clotteniana*
- 3b. Prophylls 0.8–1.2 mm wide [length to width ratio up to 7] (if density of hairs on branchlets is moderate, then lamina length to width ratio 1.2–2) ..... 4
- 4a. Podium 0.5–0.7 mm long; branchlets moderately hairy [35–48 hairs/mm<sup>2</sup>]; leaf lamina 10–15 mm long, 5–8 mm wide [length to width ratio 1.8–2]; prophylls 3.8–4 times as long as wide .... *P. tozerana*
- 4b. Podium 3–3.5 mm long; branchlets densely hairy [80–100 hairs/mm<sup>2</sup>]; leaf lamina 15–20 mm long, 3–4 mm wide [length to width ratio 3.5–4]; prophylls 4–5.6 times as long as wide ..... *P. mulliganensis*

*Prostanthera albohirta* C.T.White, *Proceedings of the Royal Society of Queensland* 47: 74 (1936).

*Holotype*: Queensland: Cook: Summit of Mount Demi, L.J. Brass 2102, 6 Feb 1932 (BRI).

Small shrub, 1–2.5 m high. *Branchlets* ± terete, densely hairy [80–100 hairs/mm<sup>2</sup>]; hairs spreading, slightly antrorse to almost patent, 0.5–0.6 mm long, straight, white; glands indistinct (covered by hairs), hemispherical, subsessile, moderately dense [40–60 glands/mm<sup>2</sup>]. *Leaves* dull green, aromatic (A. Ford pers. comm.); *petiole* 0.5–1.5 mm long, densely hairy (as for branchlets); *lamina* ovate, 6–8.5 mm long, 5–7 mm wide [length to width ratio 1.1–1.3, length of maximum width from base to total lamina length ratio 0.3–0.5], moderately hairy [20–30 hairs/mm<sup>2</sup>] (hairs as for branchlets), slightly sparser on adaxial surface; moderately glandular [40–50 glands/mm<sup>2</sup>, readily visible on abaxial surface]; base shortly attenuate to almost rounded; margin recurved to revolute, with 2 or 3 (or 4) lobes on each side (lobes porrect, 0.3–0.8 mm long, rounded); apex rounded to broadly obtuse; venation distinct, midrib and secondary veins raised on abaxial surface, sunken on adaxial surface. *Inflorescence* a frondose racemiform confluence, uniflorescence monadic; (2–)4–12-flowered [per confluence]. *Podium* 1.5–2.5 mm long, densely hairy and glandular. *Prophylls* ± persistent, inserted c. halfway along podium [ $a_1$  axis to anthopodium ratio 0.7–1.2], opposite, narrowly elliptic, c. 2 mm long, c. 0.3 mm wide [length to width ratio 4–5.6, length of maximum width from base to total lamina length ratio c. 1], moderately to densely hairy (hairs as for calyx); base attenuate; margin entire; apex obtuse; venation not visible. *Calyx* whitish green because outer surface densely hairy, with hairs white, spreading to almost patent, up to c. 0.3 mm long, moderately to densely glandular; inner surface of tube glabrous; *tube* c. 3 mm long; *abaxial lobe* very broadly to broadly ovate, c. 2 mm long, 2.5–3 mm wide at base [length to width ratio c. 1], apex rounded; *adaxial lobe* very broadly ovate, c. 3 mm long, c. 5 mm wide at base [length to width ratio c. 1], apex rounded [adaxial lobe length to abaxial lobe length ratio c. 1.5]. *Corolla* c. 10 mm long, lilac to ‘lavender’ (Brass 2102), outer surface moderately to densely hairy; *abaxial median lobe* 3.2–3.5 mm long, c. 3 mm wide, apex rounded, irregular; *lateral lobes* c. 2 mm long, c. 2.5 mm wide, apex rounded; *adaxial median lobe-pair* with a small sinus. *Stamens* with filaments glabrous; anthers c. 1.7 mm long, base of lobes glabrous, with an indistinct acumen, connective appendage [length not known] with a few narrowly triangular trichomes. *Pistil* glabrous. *Fruiting calyx* at most only slightly enlarged; *mericarps* not seen.

**Distribution:** Until recently, this species was only known by the type collection from the summit area of Mount Demi, near Mossman, Queensland, Australia. During the preparation of this manuscript, new populations were discovered in the Mount Emerald area, near Tolga, at elevations above 900 m (Ford and Conn 2013).

**Habitat:** Little is known about the habitat preferences of this species except that it occurred ‘on an exposed cliff face’ (Brass 2102) on Mount Demi, whereas from the Mount Emerald area it occurs as part of a mesic shrub-layer, in a dense woodland community or from a small protected gully dominated by *Syncarpia glomulifera* (Sm.) Nied. (Ford and Conn 2013).

**Notes:** The affinities of this species are unclear. White (1935) suggested that *P. albohirta* was closely related to *P. rugosa* from New South Wales.

**Conservation status:** Ford and Conn (2013) regard this species as ‘Critically Endangered’ (IUCN 2001).

**Other specimen examined:** Queensland: Cook: Mt Emerald, Herberton Range: Ford 2360, 4 Apr 2000 (BRI, CNS); Ford 5361, 18 Aug 2008 (BRI, CNS, NSW); Ford 6174, 1 May 2013 (BRI, CNS, MEL, NSW); Holmes 173, 24 Mar 2000 (BRI, CNS).



***Prostanthera athertoniana*** B.J.Conn & T.C.Wilson sp. nov. **Fig. 1**

*P. albohirta* C.T.White affinis, a qua margine folii utrinque lobato differt.

*Holotype*: Queensland: Cook: Dinden National Park: [previously] State Forest Reserve 607, Kahlpahlim Rock, A. Ford 1835, 7 Dec 1996 (BRI-AQ536099); iso.: CNS-QRS 111169.1 & 111169.2.

Small, dense shrub, c. 1 m high. *Branchlets* ± terete, moderately to densely hairy [60–80 hairs/mm<sup>2</sup>]; hairs antrorse to slightly spreading, 0.4–0.6 mm long, straight, white; glands indistinct (covered by hairs), hemispherical, subsessile, sparsely glandular [20–30 glands/mm<sup>2</sup>]. *Leaves* dull green, paler below, strongly aromatic; *petiole* 0.5–1 mm long, densely hairy (as for branchlets); *lamina* elliptic, oblong to obovate, (13–)15–20 mm long, (4–)6–8 mm wide [length to width ratio c. 2.5(–3.1), length of maximum width from base to total lamina length ratio 0.5–0.6], abaxial surface glabrous except midrib and a few hairs on 1 or 2 secondary veins, and sometimes with an occasional hair on surface between veins, midrib moderately hairy, denser towards base [up to 30 hairs/mm<sup>2</sup>] (hairs as for branchlets), sparsely glandular [10–15 glands/mm<sup>2</sup>], adaxial surface sparsely hairy [10–15 glands/mm<sup>2</sup>]; moderately to densely glandular (glands frequently indistinct); base shortly attenuate to obtuse; margin recurved to revolute, with 1 lobe (tooth-like) on each side (lobes ± porrect to 45° from the central axis, 0.8–1.5 mm long, obtuse); apex broadly obtuse; venation mostly indistinct, midrib raised on abaxial surface, slightly sunken on adaxial surface. *Inflorescence* a frondose racemiform conflorescence, uniflorescence monadic; 2–4-flowered [per conflorescence]. *Podium* 3–4.5 mm long, densely hairy (hairs antrorse to distinctly spreading) and glandular. *Prophylls* ± persistent, distinctly foliose, shortly petiolate, obovate, 2.4–3 mm long, 1–1.2 mm wide [length to width ratio 2.4–3, length of maximum width from base to total lamina length ratio c. 0.6], hairy on midrib and margin (hairs as for leaves); base attenuate; margin entire; apex obtuse; venation not visible. *Calyx* green and purple (Ford 1835), outer surface densely hairy, especially on tube, abaxial surface and margin of both lobes, with hairs white, ± spreading to slightly antrorse, up to c. 1 mm long, moderately to densely glandular; inner surface of tube glabrous, with lobes hairy distally and on margin; *tube* c. 2.5 mm long; *abaxial lobe* broadly ovate, c. 5 mm long, c. 4 mm wide at base [length to width ratio 1–1.3], apex rounded; *adaxial lobe* broadly ovate, 3–3.5 mm long, 4.5–5 mm wide at base [length to width ratio c. 0.6], apex rounded [adaxial lobe length to abaxial lobe length ratio c. 1]. *Corolla* 10–12 mm long, purplish mauve (Ford 1835), outer surface moderately to densely hairy; *abaxial median lobe* c. 5 mm long, c. 5 mm wide, apex rounded, slightly irregular; *lateral lobes* 5.5–6 mm long, 4–5 mm wide, apex rounded; *adaxial median lobe-pair* 3–3.5 mm long, 8.2–8.5 mm wide, with lobes overlapping and sinus c. 1.5 mm long. *Stamens* with filaments glabrous; anthers c. 1.7 mm long, base of lobes glabrous, with an indistinct acumen, connective appendage up to 0.2 mm long, with a few narrowly triangular trichomes. *Pistil* glabrous. *Fruiting calyx* not enlarged, *mericarps* not known.

**Distribution:** This species is only known by the type collection from Kahlpahlim Rock, in the Dinden National Park, Queensland, Australia. Fig. 5

**Habitat:** It is recorded as occurring in windswept heath (Ford 1835), at elevations of c. 1000 m.

**Etymology:** the specific epithet ‘athertoniana’ refers to the collection of the type material from the Atherton region of north Queensland.

**Notes:** The affinities of this species are unclear.

**Conservation status:** Not known; however, since it is only known from a single collection from one known population, we regard this species as being vulnerable, and possibly endangered.

***Prostanthera clotteniana*** (F.M.Bailey) A.R.Bean, *Austrobaileya* 5: 733 (2000) **Fig. 2**

Basionym: *Hemigenia clotteniana* F.M.Bailey, *Queensland Agricultural Journal* 15: 190 (1904).

*Holotype*: Herberton, J. Stirling s.n., [1 Jul 1904] (BRI-AQ340346).

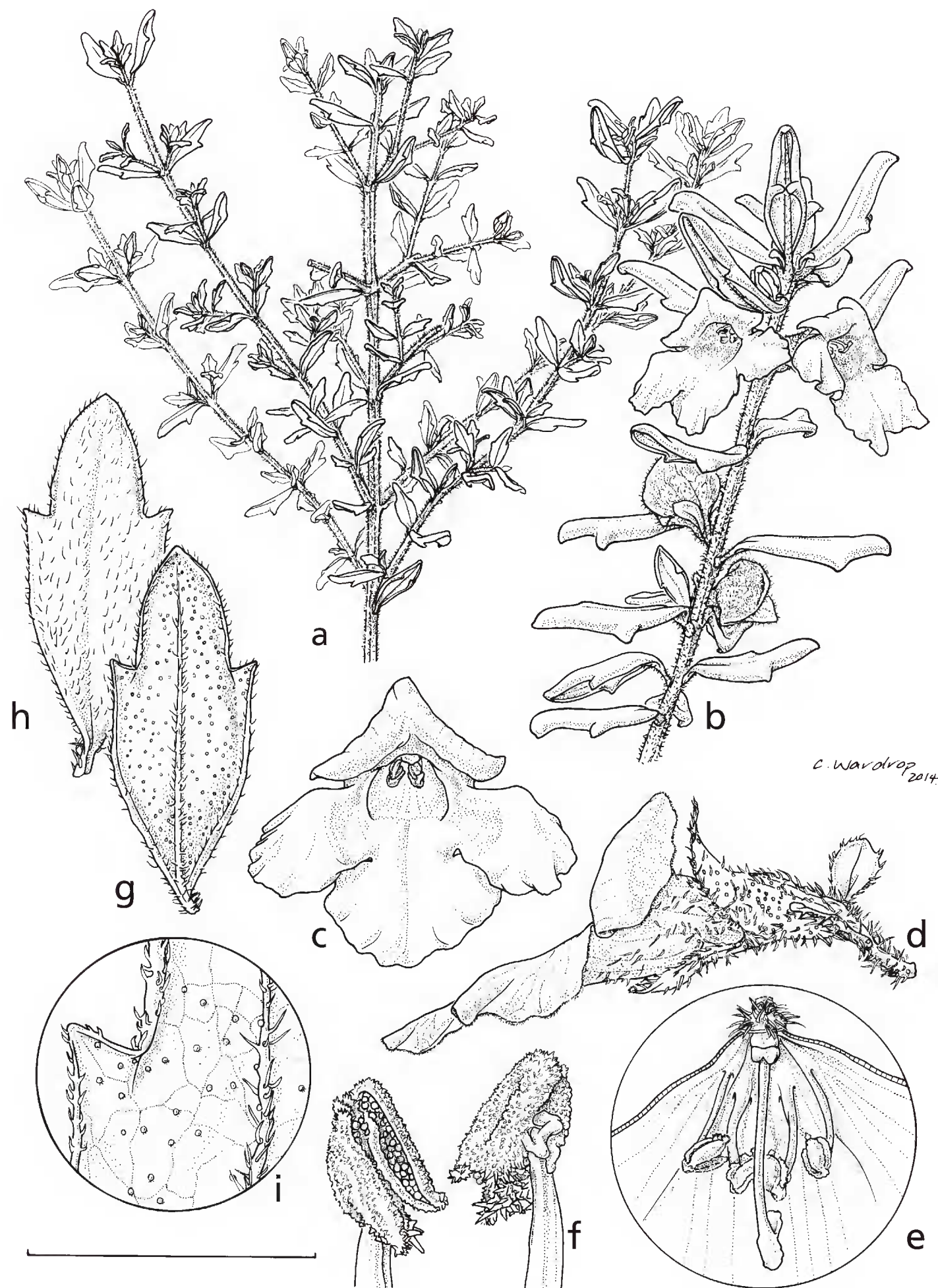
*P. atrovioleacea* F.M.Bailey, *Queensland Agricultural Journal* 16: 190 (1905).

*Holotype*: Queensland: Cook: Herberton, R.C. Ringrose s.n., Jul. 1905 (BRI).

*Prostanthera* sp. Dinden (*P.I.Forster 17342*) *sensu* Bean and Forster (2007)

Shrub c. 1.5 m high. *Branchlets* ± terete, moderately hairy [40–50 hairs/mm<sup>2</sup>]; hairs appressed, antrorse, (0.2–)0.6–0.9 mm long, straight, white; glands indistinct (covered by hairs), hemispherical, subsessile. *Leaves* dull green, sometimes with purple tinge, not aromatic or only faintly so; *petiole* 2.5–5.5 mm long; *lamina* narrowly elliptic to narrowly obovate, (14–)19–20 mm long, 3–6 mm wide [length to width ratio 3–5, length of maximum width from base to total lamina length ratio 0.5–0.8], sparsely to moderately hairy [5–35 hairs/mm<sup>2</sup>] (slightly sparser on adaxial surface), hairs 0.2–0.5 mm long, antrorse, moderately glandular;





**Figure 1.** *Prostanthera athertoniana*. **a**, habit, showing leaf arrangement on branchlet; **b**, habit, showing flowering branchlet with flowers and developing fruits; **c**, distal view of flower, showing corolla lobes, corolla throat, staminal filaments and position of anther locules; **d**, flower (lateral view) showing prophylls, calyx and corolla; **e**, open corolla showing androecium and gynoecium; **f**, stamens (ventral and dorsal view) showing staminal filament, locules, and connective; **g**, leaf lamina showing abaxial surface; **h**, leaf lamina showing adaxial surface; **i**, leaf lamina abaxial surface detail (A. Ford 1835). Scale bar: **a** = 7.5 cm; **b** = 3 cm; **c** = 4 cm; **d**, **e** = 0.75 cm; **f** = 0.24 cm; **g**, **h** = 1.5 cm; **i** = 0.5 cm.



base gradually long-tapering; margin entire; apex obtuse to shortly acuminate; venation indistinct, midrib indistinct. *Inflorescence* a frondose racemiform conflorescence, uniflorescence monadic; 2–4(–6)-flowered [per conflorescence]. *Podium* 2–4 mm long, densely hairy and glandular. *Prophylls* persistent, inserted near base of calyx [ $a_1$  axis to anthopodium ratio 2–6], opposite, narrowly obovate, 3–5.5 mm long, 0.3–0.5 mm wide [length to width ratio 8.3–10(–13.8), length of maximum width from base to total lamina length ratio 3–4(–5.5)], moderately to sparsely hairy (hairs as for leaf lamina), moderately to densely glandular; base attenuate; margin entire; apex apiculate; venation not visible. *Calyx* dull green, sometimes with maroon on adaxial lobe; outer surface sparsely to moderately hairy, becoming dense towards base, with hairs white, antrorse, moderately to densely glandular; inner surface of tube glabrous at base, hairy near and at mouth, lobes sparsely to moderately hairy; *tube* (2.9–)3–4.2 mm long; *abaxial lobe* broadly ovate, (2.1–)2.5–3 mm long, (2.1–)2.4–3.5(–3.7) mm wide at base [length to width ratio c. 0.9–1.1], apex rounded or obtuse; *adaxial lobe* ovate, appearing rhombic when distal margin concave, (3–)4.4–5.7(–7.2) mm long, (2.2–)4–5.4 mm wide at base [length to width ratio (0.8–)1–1.5(–2.2)], apex rounded [adaxial lobe length to abaxial lobe length ratio (1–)1.5–2.9].



**Figure 2.** *Prostanthera clotteniana*. Flowering branchlet of plant growing in the Ravenshoe State Forest (A. Ford 5982 & Collins). Photo: A. Ford.



*Corolla* (11–)15–17.7 mm long, purple to pale lilac; outer surface sparsely hairy on tube [(6–)13–30 hairs/mm<sup>2</sup>], more densely hairy on lobes [38–64 hairs/mm<sup>2</sup>], hairs 0.2–0.3 mm long,  $\pm$  spreading to appressed; inner surface glabrous in tube, becoming sparsely hairy distally, sparsely to moderately hairy on lobes; *tube* 8.2–12.2 mm long; *abaxial median lobe* broadly spatulate, (3.2–)6.3–8 mm long, (3–)4.2–5.5 mm wide [length to width ratio (1.1–)1.5–1.7], apex slightly irregular and rounded, bilobed (sinus 0.5–0.8 mm long, c. 1.5–1.7 mm wide distally); *lateral lobes* oblong to slightly ovate, (2.8–)3.2–4.8 mm long, (2–)2.6–3.3 mm wide [length to width ratio 1.1–1.6(–2.3)], apex rounded to obtuse, slightly irregular; *adaxial median lobe-pair* very broadly oblong to very broadly ovate, (1.6–)2.4–4.5 mm long, 2.8–3.6(–4.4) mm wide [length to width ratio (0.4–)0.7–1.3], apex of each lobe rounded, irregular, bilobed, sinus (0.4–)0.6–1.1 mm long, median margin of lobes overlapping). *Stamens* with abaxial filaments inserted (5.1–)6.1–9.1 mm above base of corolla; filaments white, (2.6–)3.5–5.1 mm long; anthers purple-blue, 0.7–1.3 mm long, base of lobes glabrous, with an indistinct acumen, connective appendage (0.3–)0.5–0.6 mm long, with one large, pointed triangular trichome up to 0.3 mm long and 1 or 2 shorter trichomes. Disc c. 0.7 mm long. *Pistil* c. 10.5 mm long; *ovary* cylindrical obovoid, 0.9–1 mm long, diam. at base c. 0.6 mm, lobes c. 0.1 mm long; *style* 8.5–8.8 mm long; *stigma lobes* (0.3–)0.5–0.8 mm long ( $\pm$  equal in length). *Fruiting calyx* enlarged, with adaxial lobe (7.5–)10–12.1 mm long, 8.2–10.2 mm wide; abaxial lobe 5–5.5 mm long, 4.9–6.1 mm wide. *Mericarps* 1.8–2.4 mm long, distally 0.8–1 mm extended beyond base of style, distal diam. 1.1–1.2 mm; seeds obloid to obovoid, 0.9–1.1 mm long, 0.8–0.9 mm diam.

**Distribution:** Known from the Atherton Tablelands, from near Atherton, Dinden, Herberton and Ravenshoe, Queensland, Australia. Fig. 5

**Habitat:** This species is recorded as growing in granite or shallow clay rhyolite-derived soils, on cliff faces, rocky outcrops and stony hills amongst stunted *Eucalyptus* woodland. Altitude 700–800 m.

**Notes:** This species is morphologically similar to both *P. mulliganensis* and *P. tozerana*. *Prostanthera clotteniana* and *P. tozerana* both have branches that are moderately hairy (40–50 hairs/mm<sup>2</sup> and 35–48 hairs/mm<sup>2</sup>, respectively), but the leaves of *P. clotteniana* are (14–)19–20 mm long and 3–6 mm wide, whereas those of *P. tozerana* are mostly shorter (10–15 mm long) and slightly wider (5–8 mm wide). *Prostanthera mulliganensis* has branches that are densely hairy (80–100 hairs/mm<sup>2</sup>, with hairs usually shorter (0.2–0.5 mm long cf. (0.2–)0.6–0.9 mm long in *P. clotteniana*).

**Conservation status:** This species is listed as “Critically Endangered” (EPBC Act Listing) and as “Endangered” (Nature Conservation Act 1992 (Queensland): May 2014 list; as cited by Department of the Environment (2012). There are only four locations known, each of relatively small populations.

**Other specimen examined:** Queensland: Cook: Ravenshoe State Forest: *Ford* 5642, 18 Dec 2009 (BRI, CNS); NNW of Bally Knob, *Ford* 5982 & *Collins*, 6 Feb 2012, (BRI, CNS, NSW); Bald Rock area, West of Ravenshoe, *A. Ford* 5642, 18 Dec 2009 (BRI, CNS); *M. Lockyer s.n.*, Dec 1974 (BRI); *K.R. McDonald* 2970 & *A.R. Bean*, 23 Jul 2004 (BRI); Ravenshoe State Forest: *K.R. McDonald* 8, 22, 32, *A.J. Dennis*, *D. House* & *E. Hamilton-Shaw*, 26 Apr 1999 (BRI); *K.R. McDonald* 2937, 2938, 19 Jul 2004 (BRI); 6 km W of Ravenshoe, *S.L. Thomson* 1989 & *G.W. Wilson*, 12 May 1999 (BRI); boundary of Mt Baldy State Forest, *K.R. McDonald* 2956, 22 Jul 2004 (BRI); 12 km W of Atherton, *G. Sankowsky* 1580 & *N. Sankowsky*, 22 Jun 2004 (BRI); tributary of Oakey Creek, off Lemongrass Drive, *A. Ford* 5485, 25 Feb 2009 (BRI); Dinden, *P.I. Forster* 17342, *S.J. Figg* & *R.L. Jago*, 17 Jul 1995.

***Prostanthera mulliganensis*** B.J.Conn & T.C.Wilson, sp. nov. Fig. 3

*P. lithospermoidoide* F.Muell. affinis, a qua pilis valde appressis, lobis calycis inaequalibus differt.

**Holotype:** Queensland: Cook: Mount Mulligan summit, c. 40 km NW of Dimbulah, *J.R. Clarkson* 5838, 16 Apr 1985 (NSW797163); isotypes: CANB, DNA, K, L, MEL, MO, PERTH, QRS.

Small shrub, 1–1.5 m high. *Branchlets*  $\pm$  terete, densely hairy [80–100 hairs/mm<sup>2</sup>]; hairs appressed, antrorse, 0.2–0.5 mm long, straight, white; glands indistinct (covered by hairs), hemispherical, subsessile, moderately dense [60–80 glands/mm<sup>2</sup>]. *Leaves* dull green, presumably not aromatic or only faintly so; *petiole* 4–5 mm long; *lamina* oblong to slightly obovate, 15–20 mm long, 3–4 mm wide [length to width ratio 3.5–5, length of maximum width from base to total lamina length ratio 0.6–0.7], sparsely to moderately hairy [15–40 hairs/mm<sup>2</sup>] (slightly sparser on adaxial surface), hairs 0.1–0.4 mm long, antrorse, moderately glandular; base attenuate; margin entire; apex obtuse; venation indistinct, midrib slightly raised on abaxial surface. *Inflorescence* a frondose racemiform conflorescence, uniflorescence monadic; 2–4(–6)-flowered [per conflorescence]. *Podium* 3–3.5 mm long, densely hairy and glandular. *Prophylls*  $\pm$  persistent, inserted near base of calyx [ $a_1$  axis to anthopodium ratio 3.3–7.5], opposite, narrowly obovate, 4–4.5 mm long, 0.8–1.2 mm wide [length to width ratio 4–5.6, length of maximum width from base to total lamina length ratio 0.8–0.9], moderately to sparsely hairy (hairs as for leaf lamina), moderately to densely glandular; base attenuate; margin entire; apex obtuse; venation not visible. *Calyx*





**Figure 3.** *Prostanthera mulliganensis*. **a**, habit, showing flowering branchlet with flowers and developing fruits; **b**, leaf, abaxial surface showing antrorse hairs; **c**, detail of apex of leaf, mostly showing adaxial surface; **d**, prophylls and base of calyx; **e**, lateral view of flower showing prophylls, calyx, corolla and partial view of stamens; **f**, stamens showing ventral (left) and dorsal view of anther locules, connective appendages, and staminal filaments (*J.R. Clarkson 5838*). Scale bar: **a** = 5 cm; **b**, **e** = 1.2 cm; **c**, **d**, **f** = 0.3 cm; **g** = 0.4 cm.

green; outer surface densely hairy, with hairs white, antrorse, moderately to densely glandular; inner surface of tube glabrous at base, hairy near and at mouth, lobes moderately to densely hairy; *tube* 3–3.5 mm long; *abaxial lobe* very broadly to broadly ovate, 2.5–3 mm long, 2.5–3 mm wide at base [length to width ratio c. 1], apex rounded; *adaxial lobe* very broadly ovate, 6–7 mm long, 6.5–7 mm wide at base [length to width ratio 1–1.1], apex rounded [adaxial lobe length to abaxial lobe length ratio 2.3–2.4]. *Corolla* 12–15 mm long, mauve, with purple to dark mauve striations and markings on the abaxial median lobe and adaxial median lobe-pair; outer surface glabrous basally, distally sparsely to moderately hairy on tube [up to c. 40 hairs/mm<sup>2</sup>], more densely hairy on lobes [60–70 hairs/mm<sup>2</sup>], hairs 0.1–0.3 mm long,  $\pm$  spreading to appressed; inner surface glabrous in tube, sparsely to moderately hairy on lobes and in sinuses between lobes; *tube* 8.5–10 mm long; *abaxial median lobe* broadly spatulate, 6–7.3 mm long, 4–4.5 mm wide [length to width ratio 1.5–1.6], apex slightly irregular and rounded, bilobed (sinus 0.8–1 mm long, c. 2 mm wide distally); *lateral lobes* oblong to slightly elliptic, 4.5–4.6 mm long, 2–2.7 mm wide [length to width ratio 1.8–2.3], apex rounded to slightly retuse, slightly irregular; *adaxial median lobe-pair* very broadly oblong to very broadly ovate, 4–5.2 mm long, 4.5–6 mm wide [length to width ratio 0.8–1], apex rounded, irregular, bilobed (sinus 0.3–0.4 mm long, 0.6–0.8 mm wide, median margin of lobes not touching or overlapping). *Stamens* inserted 4–4.5 mm above base of corolla; filaments white, (2.5–)3–4.7 mm long; anthers dark mauve, 1–1.5 mm long, base of lobes glabrous, sometimes with an indistinct acumen, connective appendage 0.3–0.7 mm long, with a few narrowly triangular trichomes 0.1–0.2 mm long. Disc 0.3–0.4 mm long. *Pistil* 12–13 mm long; *ovary* cylindrical obovoid, 0.5–0.8 mm long, diam. at base 0.5–0.8 mm, lobes 0.2–0.3 mm long; *style* 11–12.5 mm long; *stigma lobes* 0.4–0.6 mm long ( $\pm$  equal in length). *Fruiting calyx* enlarged (adaxial lobe 11–12 mm long, 9.5–10 mm wide). *Mericarps* 1.5–2 mm long, distally 0.8–1 mm extended beyond base of style, distal diam. 1.8–2 mm; seeds ellipsoid-cylindrical, c. 1 mm long, c. 0.5 mm diam.

**Distribution:** Only known from the summit area of Mount Mulligan, NW of Dimbulah, Queensland, Australia. Fig. 5

**Habitat:** This species is recorded as occurring in sandstone-derived soils (*Clarkson 5838*) and in a fissure in the sheer rock face (*Clarkson 5241*). Altitude c. 700 m.

**Etymology:** The specific epithet refers to its occurrence on Mount Mulligan.

**Notes:** *Prostanthera mulliganensis* is morphologically similar to *P. lithospermoides* F. Muell as well as *P. clotteniana* and *P. tozerana* (see notes on *P. clotteniana* above). However, it is readily distinguished from *P. lithospermoides* because the secondary veins of the leaf lamina are indistinct (cf. the secondary veins of abaxial lamina surface are raised and visible in *P. lithospermoides*); indumentum antrorse and strongly appressed (although hairs are also antrorse in *P. lithospermoides*, they are ascending, not closely appressed, held at angle of c. 45° to axis or leaf surface); leaves 15–20 mm long, 3–4 mm wide (*P. lithospermoides*: 40–50 mm long, 5–10 mm wide); calyx lobes unequal in length (*P. lithospermoides*: calyx lobes equal).

**Conservation status:** This species is only known from the summit area of Mount Mulligan. Although its conservation status is unknown, it should be considered as potentially vulnerable until additional information is available.

**Other specimen examined:** Queensland: Cook: Mount Mulligan, c. 2 km S of mine site along pipe line leading to falls on Richards Creek, 10 Apr 1984, J.R. *Clarkson 5241* (NSW).

***Prostanthera tozerana*** B.J. Conn & T.C. Wilson, sp. nov. **Fig. 4**

*P. lithospermoides* F. Muell. similis, a qua foliis obovatis, lobi calycis inaequalibus differt.

**Holotype:** Queensland: Cook: Mount Tozer summit, B.G. Briggs 7351, 22 Aug 1983, (NSW451498); **isotype:** BRI.

*Prostanthera* sp. Mt Tozer (*L.J. Brass 19478*) *sensu* Bean and Forster (2007)

Compact shrub, 0.2–1.5 m high. *Branchlets* terete, moderately hairy [35–48 hairs/mm<sup>2</sup>]; hairs appressed, antrorse, 0.2–0.7 mm long, straight, white; glands indistinct (covered by hairs), hemispherical, sessile, moderately dense [30–40 glands/mm<sup>2</sup>]. *Leaves* thick and slightly fleshy, dull green, presumably not aromatic; *petiole* 2–3 mm long; *lamina* obovate, 10–15 mm long, 5–8 mm wide [length to width ratio 1.8–2, length of maximum width from base to total lamina length ratio 0.6–0.7], sparsely to moderately hairy [8–17 hairs/mm<sup>2</sup>] (usually denser on midrib of abaxial surface, slightly sparser on adaxial surface), hairs 0.3–0.5 mm long, antrorse, moderately glandular; base attenuate; margin entire; apex obtuse; venation indistinct, midrib slightly raised on abaxial surface. *Inflorescence* a frondose racemiform conflorescence, uniflorescence monadic; 4–8-flowered [per conflorescence]. *Podium* 0.5–0.7 mm long, densely hairy and glandular. *Prophylls*  $\pm$  persistent, inserted near base of calyx [ $a_1$  axis to anthopodium ratio c. 2.8], opposite, narrowly elliptic,

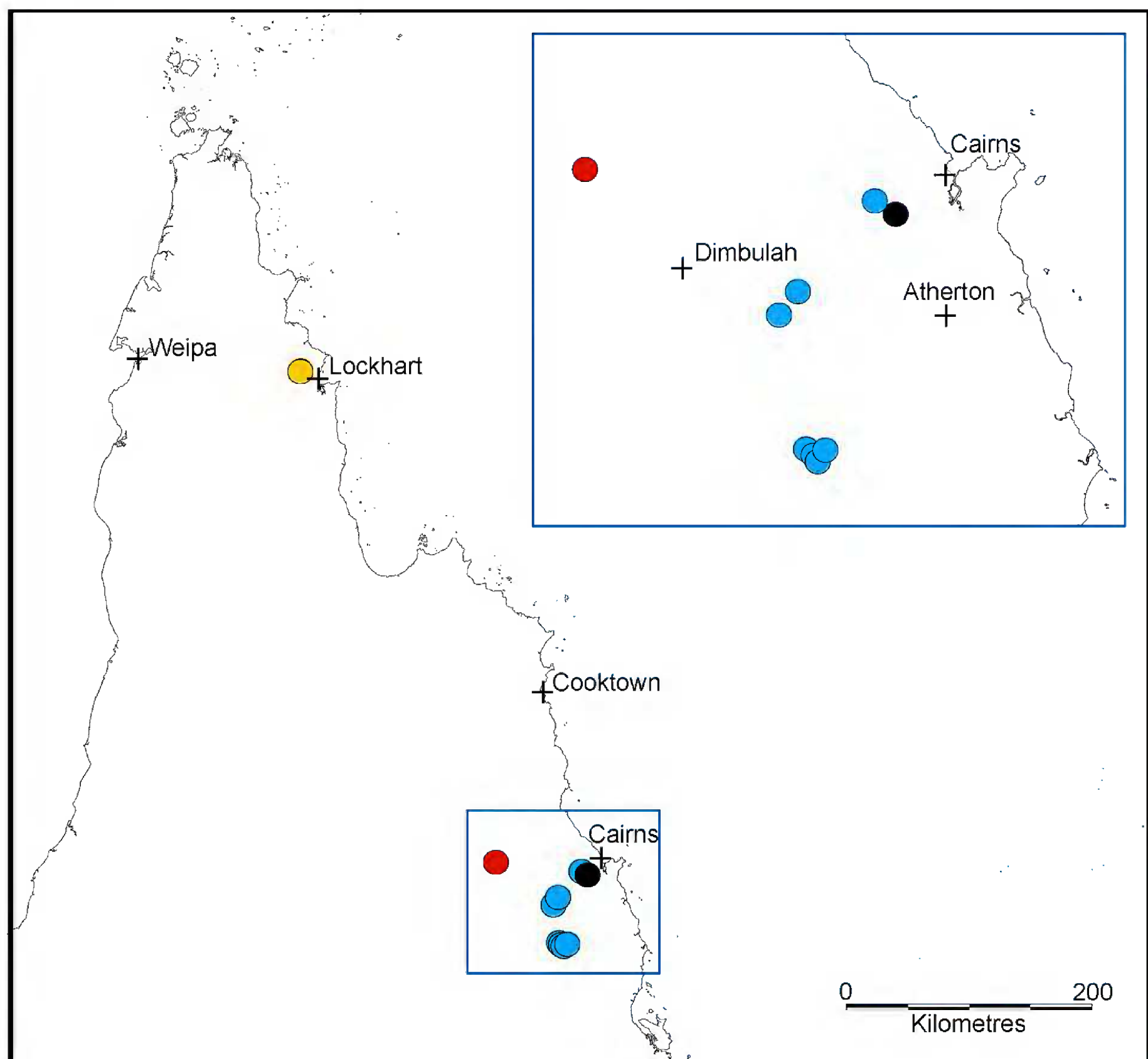




**Figure 4.** *Prostanthera tozerana*. **a**, habit, showing flowering branchlet with flowers and developing fruits; **b**, detail of prophyll; **c**, lateral view of flower showing prophylls, calyx, corolla, partial view of stamens, style and stigma; **d**, stamens showing oblique dorsal view of anther locules, anther appendages and staminal filaments (adaxial stamen – left; abaxial stamen – right); **e**, leaf, abaxial surface showing antrorse hairs (*B.G. Briggs 7351*). Scale bar: **a** = 5 cm; **b** = 0.3 cm; **c**, **e** = 1 cm; **d** = 0.2 cm.



4–4.5 mm long, 1–1.2 mm wide [length to width ratio 3.8–4, length of maximum width from base to total lamina length ratio c. 1], moderately to sparsely hairy (hairs as for leaf lamina), moderately to densely glandular; base attenuate; margin entire; apex obtuse; venation not visible. *Calyx* greenish purple (*Briggs 7351*); outer surface densely hairy basally, moderately to sparsely hairy distally, with hairs white, antrorse, moderately to densely glandular; inner surface of tube glabrous, lobes moderately to densely hairy; *tube* 2–2.5 mm long; *abaxial lobe* very broadly to broadly ovate (to almost circular), 6.4–7 mm long, 5.5–6.5 mm wide at base [length to width ratio 1.1–1.2], apex rounded; *adaxial lobe* very broadly ovate, 4.3–4.5 mm long, 4–4.2 mm wide at base [length to width ratio 1–1.1], apex rounded [adaxial lobe length to abaxial lobe length ratio 1.5–1.7]. *Corolla* 12–15 mm long, pale purplish mauve; outer surface glabrous basally, distally sparsely to moderately hairy [up to c. 40 hairs/mm<sup>2</sup>], hairs 0.1–0.3 mm long, ± spreading to appressed; inner surface sparsely hairy in throat and on base of lobes; *tube* 8.5–9 mm long; *abaxial median lobe* broadly spatulate, 6.5–7.4 mm long, 5.5–6.2 mm wide [length to width ratio 1.1–1.2], apex slightly irregular and rounded, bilobed (sinus 1.8–2 mm long, c. 2 mm wide distally); *lateral lobes* oblong to slightly elliptic, 6–7 mm long, 2.8–3.4 mm wide [length to width ratio 2–2.1], apex rounded to slightly retuse, slightly irregular; *adaxial median lobe-pair* very broadly oblong to very broadly ovate, 6–6.5 mm long, 6.2–6.5 mm wide [length to width ratio 0.9–1], apex rounded, irregular, bilobed (sinus c. 2 mm long, median margin of lobes slightly touching or overlapping). *Stamens* inserted 4–4.5 mm above base of corolla; filaments 2.5–3 mm long; anthers 1–1.2 mm long, base



**Figure 5.** Distribution map of *Prostanthera albobhirta*, *P. athertoniana*, *P. clotteniana*, *P. mulliganensis* and *P. tozerana* in far-northern Queensland, Australia, occurring in Northern Cape York Peninsula, Cook botanical district (in part); insert map (upper right) detail showing distribution of species of *Prostanthera* in the Cairns–Dimbulah region. *P. athertoniana* = black; *P. clotteniana* = blue; *P. mulliganensis* = red; *P. tozerana* = orange.



of lobes glabrous or with a few narrowly triangular trichomes (up to 0.1 mm long), connective appendage 0.6–0.7 mm long, with a few narrowly triangular trichomes 0.1–0.2 mm long. Disc 0.4–0.5 mm long. *Pistil* 9.5–10.4 mm long; *ovary* cylindrical obovoid, 0.2–0.4 mm long, diam. at base 0.5–0.8 mm, lobes 0.2–0.4 mm long; *style* 9–9.5 mm long; *stigma lobes* 0.3–0.5 mm long ( $\pm$  equal in length). *Fruiting calyx* enlarged. *Mericarps* 1.8–2 mm long, distally 0.9–1 mm extended beyond base of style, distal diam. 1.8–2 mm; seeds ellipsoid-cylindrical, c. 1 mm long, c. 0.5 mm diam.

**Distribution:** Only known from the summit of Mount Tozer, Tozer Range, Kutini-Payamu (Iron Range) National Park, Queensland, Australia. Fig. 5

**Habitat:** This species is recorded as occurring in shallow rocky soils in exposed situations (*Brass 19478*), and amongst boulders (*Briggs 7351*). Altitude c. 500 m.

**Etymology:** The specific epithet refers to its occurrence on Mount Tozer.

**Notes:** *Prostanthera tozerana* is the most northerly species known for the genus, possibly the most isolated species, being c. 700 km north of the next nearest known species, *P. mulliganensis*. Attempts by both authors to recollect this species have been unsuccessful.

This species is characterized by being moderately to densely hairy and hairs mostly appressed; leaves obovate, 10–15 mm long, 5–8 mm wide; inflorescences that are leafy and racemiform; flowers with corolla pale purplish mauve and anthers with a connective appendage; fruiting calyx enlarged to about twice the size of the flowering calyx. *Prostanthera tozerana* is morphologically similar to *P. lithospermoides* F.Muell as well as *P. clotteniana* and *P. mulliganensis* (see notes on *P. clotteniana* above).

**Conservation status:** Although this species occurs in the Kutini-Payamu (Iron Range) National Park, the full extent of its distribution is unknown. Currently, it appears to have a very restricted distribution and so should, at least, be considered as vulnerable.

**Other specimens examined:** Queensland: Cook: Kutini-Payamu National Park: Summit of Mount Tozer, Tozer Range, L.J. Brass 19478, 7 Jul 1948 (A, CANB, K); E. Volck 2427, Sep 1962 (BRI); Mount Tozer, Iron Range, E. Volck AFO 3265, Aug 1966 (CNS).

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